**K-5 Math Lesson Plan**

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| **Teacher:** Herbin, Tennyson, Harris, Williams | | | **Grade:** 5th | | | | **Date(s)**: September 2012 | |
| **Unit Title:**  Understanding the Decimal Place Value System | | | | | **Corresponding Unit Task:** Lesson 3  2012 Summer Olympics— Who Gets the Gold? (Teach AFTER assessment task 3—listed in Assessment Section) | | | |
| **Essential Question(s):**   * How can I compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons? * How can I use place value understanding to round decimals to any place? * How can I explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10? | | | | | | | | |
| **Materials/Resources** | | | | | **Essential Vocabulary** | | | |
| **Teacher:**  Computer with internet capabilities, chart paper | | **Student:**  Paper, pencil, Task 3 Who Gets the Gold? Assessment, Teacher Vision Worksheet, Powers of ten matching cards, Powers of ten activity | | | | Vocabulary from previous 3 lessons for this task  Power  Exponent | | |
| **Learning Experience** | | | | | | | | |
| **8 Mathematical Practices:**  √ 1. Make sense of problems and persevere in solving them.  √ 2. Reason abstractly and quantitatively.  √ 3. Construct viable arguments and critique the reasoning of others.  √ 4. Model with mathematics.  5. Use appropriate tools strategically.  √ 6. Attend to precision.  7. Look for and make use of structure.  √ 8. Look for and express regularity in repeated reasoning. | **Common Core State Standards:**  **5.NBT.4**  Use place value understanding to round decimals to any place. (Correlates to NCSCOS Math Objective 1.01)  **5.NBT.3b**  Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. (Correlates to NCSCOS Math Objective 1.01)  **5.NBT.2**  Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. | | | | | | | |
| **I Can Statement(s):**   * I can record results of comparisons of decimals to the thousandths. * I can use the symbol (=) when comparing numbers. * I can use the symbol (<) when comparing numbers. * I can use the symbol (>) when comparing numbers. * I can compare two decimals to the thousandths based on placement of the digits. * I can round a decimal to the tenths place. * I can round a decimal to the hundredths place. * I can round a decimal to the thousandths. * I can explain patterns in the number of zeros of a product when multiplying by powers of ten. * I can explain patterns in the placement of the decimal point when multiplying by powers of ten. * I can explain patterns in the placement of the decimal point when dividing by powers of ten. | | | | | | | |
| **Activating Strategy/Hook:** (How will students become cognitively engaged and focused?)  Allow students to check their understanding by completing the linked worksheet for practicing ordering, comparing, and rounding decimals. <http://www.teachervision.fen.com/tv/printables/Math_5_PS_2-12.pdf> | | | | | | | |
| **Teacher Directed:**  **Index Notation and Powers of 10** (Note: Index and Power mean the same things as Exponent)  10 to the Power 2  The exponent (or index or power) of a number says how many times to use the number in a multiplication.  102 means 10 × 10 = 100 (It says 10 is used 2 times in the multiplication)  Example: 103 = 10 × 10 × 10 = 1,000  In words: 103 could be called "10 to the third power", "10 to the power 3" or simply "10 cubed"  Example: 104 = 10 × 10 × 10 × 10 = 10,000  In words: 104 could be called "10 to the fourth power", "10 to the power 4" or "10 to the 4"  You can multiply any number by itself as many times as you want using this notation (see Exponents), but powers of 10 have a special use ...  **Powers of 10**  "Powers of 10" is a very useful way of writing down large or small numbers.  Instead of having lots of zeros, you show how many powers of 10 you need to make that many zeros  Example: 5,000 = 5 × 1,000 = 5 × 103  5 thousand is 5 times a thousand. And a thousand is 103. So 5 times 103 = 5,000  Can you see that 103 is a handy way of making 3 zeros?  Scientists and Engineers (who often use very big or very small numbers) like to write numbers this way.  Example: The Mass of the Sun  The Sun has a Mass of 1.988 × 1030 kg.  It would be too hard for scientists to write 1,988,000,000,000,000,000,000,000,000,000 kg (And very easy to make a mistake counting the zeros!)  Example: A Light Year (the distance light travels in one year)  It is easier to use 9.461 × 1015 meters, rather than 9,461,000,000,000,000 meters  It is commonly called Scientific Notation, or Standard Form.  The Trick  While at first it may look hard, there is an easy "trick":  **The index of 10 says ...**  ... how many places to move the decimal point to the right.  Example: What is 1.35 × 104 ?  You can calculate it as: 1.35 x (10 × 10 × 10 × 10) = 1.35 x 10,000 = 13,500  But it is easier to think "move the decimal point 4 places to the right" like this:  1.35 13.5 135. 1350. 13500. | | | | | | | |
| **Guided Practice:**  Using Powers of 10 matching cards (found in unit 1 folder), distribute one card per student. Have students find their match using Stand Up, Hand Up, Pair Up. (Play music-optional-and allow students to move throughout the room. After a short amount of time, stop the music and students will high five another student, then pair up to discuss if their number is greater than, less than, or equal to their partners number. Use the Random Name Picker (For example: <http://primaryschoolict.com/random-name-selector/> ) to choose a pair and discuss their answers. Begin music again and repeat activity.) | | | | | | | |
| **Independent Practice:**  Students will complete the Powers of 10 Activity (Reflect on the Past Worksheet). | | | | | | | |
| **Closing/Summarizing Strategy:**  In their math journals, have students answer the starred EQ. After sufficient time, discuss students’ answers as a class. | | | | | | | |
| **Differentiation Strategies** | | | | | | | | |
| **Extension** | | | | **Intervention** | | | | **Language Development** |
| * Students will use the “Comparing Decimals” activity to practice using >, <, = to find the winners of the Olympic trials. * Student researches other sports to compare times using >, <, =. * Student develops a product of choice to compare winning times of different sports and draws conclusions about the times. | | | | * Student compares numbers one digit at a time. * Student uses audio recording of the sections that the student needs to read. * Use unit cubes to represent each number. | | | | * Review mathematical symbols and terms: less than; greater than; equal to * Abbreviated form of task provided after the original task if needed. * Writing to Learn: After key points in the unit (after each task?), have students write in a journal using the following sequence: * Record: state what they have learned * Compare: Students pair up and compare what they have written and clarify. * Revise: Based on the interaction, students create a more developed and polished version of their statements. * Combine: Students collaborate to mesh their summaries * Review: Students use previous entries to prepare and guide them through subsequent tasks. * • (Adapted from “Writing to Learn” by Robert Marzano in Educational Leadership, February 2012.) |
| **Assessment(s): TASK 3**  Using the data from “Who Gets the Gold?” Students place finishing times in order from fastest to slowest. This task will also allow students to round a completion time to nearest whole, tenth, and hundredth second.  <http://www.nj.com/olympics/index.ssf/2010/02/us_wins_first_olympic_gold_med.html> Have students read the actual article to see if they got the results correct. | | | | | | | | |
| **Teacher Reflection:** (Next steps?)  • What went well?  • Student understanding/misconceptions.  • Specific notes about students’ thinking.  • What do I need to reteach/review tomorrow or in the future?  • New ideas or changes for next time? | | | | | | | | |